# Use of and Attitudes About Milking the Umbilical Cord by Family Practice Physicians in Indiana

**An Honors Thesis (HONRS 499)**

**By**

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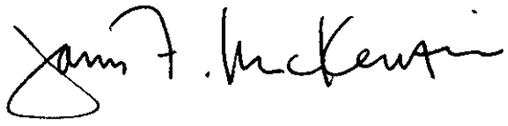

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## THESIS ABSTRACT

Thesis: Use of and Attitudes About Milking the Umbilical Cord by Family Practice Physicians in Indiana

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The purpose of this study was to identify the prevailing opinions on the benefits and drawbacks of milking an infant's umbilical cord immediately after delivery. Of the 387 questionnaires distributed, 86 were unusable because of disconnected or incorrect fax number, or the physician was no longer working at that location. Of the remaining 301, only 59 (20%) of the responses were usable. Of those physicians who practice obstetrics (n=33), approximately 18.2 % (n=6) "milk" the cord. Of those respondents who do not "milk" the cord (n=27), 29.6% have never learned to do so and 22.2% have not seen data supporting its use. The respondents who do not milk the cord (n=27) indicated they would "milk" the cord if evidence shows it is a helpful procedure. Overall, the majority of respondents (74.6%) do not believe that milking the umbilical cord should be used routinely in the birthing procedure.

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# CHAPTER ONE

## Introduction

After a baby is born, the infant is evaluated at one minute and five minutes for signs of well-being. Over the last 50 years, the instrumentation used for this evaluation is an Apgar test. Apgar evaluations help the health care team estimate the baby's general condition at birth; the higher the score, the more reassuring the baby's health. Various methods have been employed to improve an infant's initial well-being, but one method that has yet to be studied deals with milking placental blood toward the newborn before clamping the umbilical cord.

The Apgar test is comprised of five different criteria. Based on heart rate, respiratory efforts, muscle tone, response to stimuli, and skin color, the attending physician or nurse can judge if the baby may be in need of assistance as it adapts to the new world, outside the womb. Each criterion is scored on a scale of 0-2, and then all the scores are totaled. According to the American Academy of Pediatrics (AAP, 2000), about nine out of ten newborns in this country score in the 8 to 10 range, with few scoring a perfect ten due to peripheral cyanosis. When an infant has a low one minute Apgar score, the staff will offer the infant supplemental oxygen in an effort to help the infant's transition into the world. Improvement will be reflected in a more favorable five minute Apgar score.

The method of milking an infant's umbilical cord is a common medical practice, but has not been studied with regard to its effect on raising Apgar scores (Grisaru et al., 1999). When the cord is milked, 50-100 cubic centimeters of blood are directly

transfused to the infant, which increases the infant's oxygen supply and may improve Apgar scores. A concern held by physicians about milking the cord concerns increased bilirubin leading to neonatal jaundice. Because of the concern about milking the umbilical cord, there is a need to further study the procedure. The purpose of this survey was to identify the prevailing opinions of the drawbacks and benefits of milking an infant's umbilical cord immediately after delivery.

## The Problem

The problem of this study was twofold: 1) determine the opinions family physicians have on milking the umbilical cord and 2) determine the status of milking the umbilical cord in Indiana family physicians.

## Delimitations of the Study

The study was limited in the following ways:

1. The subjects of this study were limited to family physicians in Indiana.
2. The data collection instrument was faxed once with all non-responding participant's receiving a second fax, and a final third instrument was faxed to all non-respondents of the second fax.

## Limitations of the Study

The study was limited in the following ways:

1. The rate of response to the survey.
2. Physician access to fax machine.
3. Accuracy of fax numbers.

## Assumptions of the Study

The basic assumptions of the study were:

1. The physicians are interested enough in the study to respond.
2. The physicians will answer the questionnaire honestly.

## Questions to be Answered

This study was designed to answer the following questions?

- Do Indiana family physicians ever "milk" the umbilical cord after delivery?
- Why and when do Indiana family physicians "milk" the umbilical cord?
- What do Indiana family physicians see as the benefits of milking the umbilical cord?
- What do Indiana family physicians see as the drawbacks to milking the umbilical cord?
- What is the status of milking the umbilical cord by family practice physicians in Indiana?
- How frequently do Indiana family physicians "milk" the umbilical cord if the infant needs it?

## Definition of Terms

The terms that were specific to this study and needed to be defined were:

- Apgar Score: A ten point scale used to assess the condition and prognosis of newborn infants.

- Bilirubin: The orange colored or yellowish pigment in bile. It is derived from hemoglobin of red blood cells that have completed their life-span and are destroyed and ingested by the macrophage system of the liver, spleen, and red bone marrow.
- Jaundice: Common condition in newborn infants that causes skin to look yellow due to an elevated level of unconjugated serum bilirubin.
- Milking the Umbilical Cord: Physically massaging the umbilical cord to move blood from the placenta to the infant before the cord is clamped.

## Significance of the Study

The purpose of this study was to 1) determine the status of "milking" the umbilical cords by family physicians in Indiana and 2) to identify the prevailing opinions of the drawbacks and benefits of milking an infant's umbilical cord immediately after delivery. The results may be used by physicians in their methods of umbilical cord care immediately after birth. The results will also be used to determine if any clinical trials could be conducted in the future.

# CHAPTER TWO

# REVIEW OF RELATED LITERATURE

## Introduction

A review of literature related to the effect of milking an umbilical cord on Apgar scores and the occurrence of neonatal jaundice is presented in this section. The review is organized into the following headings: (a) Apgar scores and accuracy in determining fetal health, (b) traditional practices in umbilical cord care, (c) current medical practices of umbilical cord care, (d) diagnosis of neonatal jaundice, and (e) summary.

## Apgar Scores and Accuracy in Determining Fetal Health

The Apgar score, devised in 1952 by Virginia Apgar is a quick method of assessing the clinical status of a newborn infant. Apgar, Holaday, James, Weisbrot, and Berrien (1958), studied 15,348 infants born at the Sloane Hospital for Women between 1952-1956. The condition of each newborn was expressed by a score, the sum of five numbers obtained within 60 seconds after the birth was complete. These numbers were determined by objective observations of heart rate, promptness and vigor to the first respiratory efforts, and reflex responses to certain stimuli, muscle tone, and color (1958). The highest possible score was 10, with this being optimal health for the infant. The researchers found that death among infants scoring a 2, 1, or 0 was 15%, while infants who scored a 10 was 0.13%. The score was especially useful in judging the need for resuscitative measures.

This scoring system, which encouraged delivery-room personnel to pay close attention to the newborn, was quickly adopted in delivery rooms throughout the United States and other countries. Although a popular method for neonatal health assessment, the value of Apgar scores has become controversial because of attempts to be used as a predictor of the neurological development of the infant, for which it was never intended (Nelson & Ellenberg, 1981). Between January 1988 and ending in December 1998, Casey, McIntire, and Leveno (2001) carried out a cohort analysis of 151,891 live-born infants in Parkland Hospital, Dallas, Texas, excluding infants born before 26 weeks or with major malformations identified. Paired Apgar tests and umbilical-artery blood pH values were ascertained on 145,627 infants to assess if either test was a better predictor of infant death in the first 28 days after birth. The researchers found that term infants with a five-minute Apgar score of 0-3 were at eight times the risk for mortality compared to term infants with an umbilical blood pH of 7.0 or less, concluding that the Apgar system remains an effective predictor of neonatal survival.

## Traditional Practices in Umbilical Cord Care

"About two-thirds of births in developing countries take place outside health facilities and almost half the women are delivered by untrained birth attendants, family members, or delivery on their own. A wide variety of traditional practices and beliefs are associated with care of the umbilical cord" (WHO, 1999, p. 5). The belief of many cultures is that all life from the placenta must be transferred to the newborn otherwise it will die.

During a study of the problems associated with over-crowding in the wards of Maternity Hospital, Accra, Ghana, Otoo (1973) observed the traditional childbirth practices of the Ga people. Ga women believed that having children was of vital importance, and childlessness was a stigma. When a Ga woman has her child, the cord is cut when the baby cries, using a sharp, unsterile tool. However, if the baby did not cry, the cord was milked from the maternal end towards the baby to "bring the baby's soul into it from the mother" (p. 92).

## Current Medical Practices of Umbilical Cord Care

Opinions vary on what constitutes the best umbilical cord care. In traditional births that take place outside of a hospital or medical institution, late cord clamping is the usual procedure. However, in institutions early cord clamping is common. The timing of cord clamping may have effects on both the mother and infants (WHO, 1999).

A number of observational studies and trials have been conducted to determine the effect of the timing of cord clamping on the newborn. The blood volume of a newborn infant varies over a wide range depending on the amount of placental transfusion after birth. Gunther (1957) found that when an umbilical cord was left unclamped, indirect placental transfusion increased 55 grams to as much as 180 grams in weight of the infant during the first minute of life. The amount of blood is estimated to be 40% more than that of infants who had their cords immediately clamped.

The difference in blood volume of early versus late-clamped infants caused many questions to arise concerning the health of the infant. There are conflicting studies dealing with the affect of increased red blood cell volume on the heart and respiratory

systems. In a study of infants aged 29 minutes to 11 hours, it was found that early-clamped infants pulmonary artery pressure dropped to 70% of the systemic by the second hour and to almost 50% of the systemic by the fourth hour. The late clamped infants pulmonary artery pressure remained at 90% of the systemic for the first nine hours of life (Arcilla, Oh, Lind, 1966).

Another area of conflicting views deals with increased bilirubin. Saigal, O'Neill, Surainder, Chua, and Usher (1972) found a significant correlation between delayed cord clamping and bilirubinemia at 72 hours of age in both premature and full term infants. The incidence of hyperbilirubinemia was significantly higher in premature infants, gestational age of 28 to 36 weeks, whose cords were clamped at five minutes. Likewise, in full term infants, bilirubinemia was also related to larger placental transfusions.

## Diagnosis of Neonatal Jaundice

Jaundice is a common condition in new born infants, usually appearing shortly after birth that causes the skin to appear yellow. A baby becomes jaundiced when bilirubin, which is naturally produced in the body, builds up faster than a newborn's liver can process and remove it from the body. Virtually all babies have an elevated level of bilirubin, but only about 50% are visually jaundiced, with Asian newborns having a higher incidence (Beeby, 1998).

A physician's decision to test for bilirubin levels is usually based on the infant's color in the days after birth. Moyer, Ahn, and Sneed (2000) conducted a study to examine the reliability of visual assessment as an indicator of elevated bilirubin levels in neonates. A total of 122 infants, over 36 weeks of gestational age, and 4 lb. 6 oz., were

examined. At the time bilirubin levels were obtained, two observers independently assessing prespecified areas of the body that were believed to reflect the progression of jaundice. Each observer was also asked to predict the infant's bilirubin level. It was concluded that clinical examination of newborns alone is not a reliable way to predict the presence or absence of jaundice.

## Summary

A thorough review of the literature showed that there are various cultures that habitually milk the umbilical cord and perceive this procedure as beneficial to the infant. However, there was limited information on the process, benefits, and drawbacks to milking an umbilical cord. Conflicting opinions on the timing of cord clamping and its benefit to an infant were stated as major problems in the field of neonatal research. By reviewing the related literature, the researcher determined than the discovery of opinions pertaining to milking the umbilical cord was a necessary endeavor.

# CHAPTER THREE

# RESEARCH METHODOLOGY

## Introduction

Discussed in this section of the proposal are the following: research design, subject selection, instrumentation, data collection, and data analysis.

## Research Design

A descriptive cross-sectional survey was the design employed in this study. This method was selected for four reasons: 1) the researchers' desire to collect information from a sample of family physicians throughout Indiana, 2) the resources available to collect the data, 3) the time frame in which the data could be collected, and 4) the researchers' wish to determine the overall physician opinion on milking the umbilical cord before doing clinical trials.

## Arrangements for the Study

This study was approved as an exempt study by the Institutional Review Board (IRB) of Ball State University (See Appendix A) and the IRB at Cardinal Health System, Inc. (the parent corporation for Ball Memorial Hospital) on November 8, 2002 (See Appendix B).

## Methods

### *Subjects*

The subjects chosen for this study were a random sample of practicing family physicians in the state of Indiana (N= 387). This number was chosen for a 5% precision

rate ( Yamane, 1967). It was determined that a systematic random sample would be used instead of a census due to the number of family physicians in Indiana (N=1,160). A systematic random sample was also chosen because of the availability of the alphabetical list of numbers that constituted the sample frame.

Names, addresses, office numbers, and fax numbers for the subjects were obtained from the database maintained by the Indiana Academy of Family Physicians. A table of random numbers (TRN), was used to determine the starting point for subject selection in the sample frame. This number then correlated to the first physician added to the subject list. From this point, two physician names were skipped and the next physician was added to the subject list. This continued until the original starting point was met and resulted in 387 total subjects.

## Instrumentation

An original instrument was developed for this study due to the lack of an existing instrument that dealt with the specific topics on which the researcher wanted to obtain information.

### *Table of Specifications*

After a review of related literature, the researcher created the following table of specifications to determine the status of milking umbilical cords by family practice physicians.

I. Attitudes towards milking the cord

   A. Concerns

   B. Benefits for the infant

C. Drawbacks for the infant

II. Status of milking the umbilical cord in Indiana

A. Basis for milking the cord

B. Frequency of milking the cord by family practice physicians

III. Demographic variables of respondents

*Instrument Items*

Ideas for several questionnaires were generated through reviewing the literature and conferring with local physicians. A total of 12 questions were included in the initial draft of the instrument. The instrument was then reviewed by the researcher and her advisor. Several questions were changed so that they would generate nominal data instead of ratio data in order to produce a more meaningful statistical analysis. After this review the draft instrument (See Appendix C) was comprised of 15 questions.

*Validity*

To ensure the quality of data derived from the use of this instrument, content validity was established by using a two-step process described by McKenzie, Wood, Kotecki, Clark, and Brey (1999). In doing so, the following procedure was followed.

*Selection of the Jury*. Selection of the jury was based upon the following criteria. Each juror had to agree to criteria one and two and possess at least one of the criteria noted in items three and four.

1. Willingness to serve on the jury.
2. Employed as a physician.
3. Conducted research in the field of obstetrics.
4. Knowledge of obstetrics and fetal health.

Twelve individuals were asked to serve on the jury of experts. Each of these individuals received a letter (see Appendix D) describing the study and requesting his/her participation in the critique of the instrument. A self-addressed, stamped postcard (See Appendix E) was enclosed for their response. Nine (See Appendix F) chose to accept the invitation.

Upon receiving their affirmative response via postcard, a packet of materials was sent out to the nine jurors for a qualitative review. The task of the jurors was to evaluate the initial draft for completeness, conciseness, appropriateness, and clearness of questions, instructions, and content. If any of these areas needed revision, the jurors were able to provide written input. Each juror received a copy of the draft instrument (See Appendix C), a letter with instructions (See Appendix G), a form to evaluate the draft instrument (See Appendix H), and a self-addressed, stamped return envelope. Based on this review, the following changes were made to the instrument: the definition of "milking" the umbilical cord being added to the instructions and one question was deleted because the majority of jurors believed it to be repetitive.

The revised instrument was then sent out to the jurors for a quantitative review. The task of the jurors was to evaluate the final validity of the questions contained in the instrument. A scale of 2-0, with 2 being an essential question, 1 being a useful, but not necessary question, and 0 being an unnecessary question, was placed by each question and the physicians were asked to rank the questions based on the instructions provided (See Appendix I). This led to the final instrument containing 10 questions (See Appendix J).

*Data Collection*

Fax and phone numbers for all of the family physicians who are members of the Indiana Academy of Family Physicians were obtained from the IAFP. From this listing, a systematic random sample was selected. The fax numbers of those selected were then programmed into WinFax, a computer fax program. All of the physicians in the sample were faxed the questionnaire on the second Monday in January 2003. Faxing began at 6:00 a.m. and ended when all the faxes had been sent. In addition to the questionnaire, the subjects received a cover letter stating the intent the study (see Appendix K). The physicians who returned the questionnaire had their name deleted from the fax program. A follow-up fax was sent to all non-respondents on the third Monday in January 2003. The physicians who returned this questionnaire also had their name deleted from the fax program. A third and final follow-up survey instrument was sent to all non-respondents on the fourth Monday in January 2003.

*Data Analysis*

Once the instruments were received, the answers to the questionnaires were transferred to scan-tron answer sheets and prepared for statistical analysis. The data was analyzed using univariate and bivariate procedures. Frequency distributions were performed for each question that offered an answer and percentages of each response to each question were calculated. Frequency counts were performed for all write-in questions. Chi-square tests were also performed to see whether or not there were any relationships between the opinions of physicians who practiced obstetrics and those who did not on the benefits and drawbacks to milking the cord and whether or not this should be commonly practiced.

# CHAPTER FOUR

# RESULTS

## Introduction

In order to clarify the presentation, analysis and discussion of the data, the chapter has been divided into four sections: (1) instrument return rate; (2) presentation of the data; (3) discussion of the data; and (4) limitations.

## Instrument Return Rate

A total of 387 questionnaires were faxed to the systematic random sample of approximately 33% of the membership of the Indiana Academy of Family Physicians (IAFP) during the second week of January 2003. The initial faxing of the questionnaire resulted in 60 instruments being returned. The first follow-up questionnaire was faxed one week later yielded 35 returns. The final follow-up questionnaire was faxed a week after the first follow-up and yielded 21 returned questionnaires. Four weeks after the initial faxing, a total of 116 (30%) questionnaires had been returned. However, 41 (10.6%) surveys were returned stating that the intended recipient did not work at that location any longer and 45 (11.6%) were sent to incorrect or disconnected numbers. Also, 16 (4.1%) of the returned surveys stated that the physician did not wish to participate in the study. This resulted in 59 questionnaires available for analysis.

## Presentation of the Data

The data are presented in a question-by-question response of the sample. The data answers the six questions asked by the researcher prior to the beginning of this study.

### *Question-by-Question Response of the Sample*

The first question the respondents were asked to answer was if they performed obstetrics in their practice. The data revealed that 33 (55.9%) of the respondents practice obstetrics and the remaining 26 (44.1%) did not.

Those who indicated they practiced obstetrics (n=33) were asked to answer question 2. The second question asked if the physicians ever "milked" an infant's umbilical cord by moving the blood away from the cord and towards the baby before clamping the cord. Six of the 33 (18.2%) responded that they "milk" the umbilical cord, and the remaining 27 (81.8%) of respondents do not "milk" the cord.

The 27 (81.8%) respondents who indicated they do not "milk" the umbilical cord were asked to answer question 3. In the third question, the respondents were asked to answer why they do not "milk" the umbilical cord. The results of this question are presented in Table 1. The data indicate that eight (29.6%) of the physicians responding do not "milk" the cord because they never learned, seven (26%) checked other, six (22.2%) stated that there was no good data indicating that "milking" should be performed, two (7.4 %) thought it was not important, another two (7.4%) answered with other and no good data indicating it should be performed, and the final two (7.4%) stated that they never learned and there was no good data indicating is should be performed.

Reasons stated by those who answered "other" (n=7, 26.0%) included 1) believes that milking the cord may cause increased bilirubin, polycythemia, volume overload, hyperviscosity, or posed a risk to the infant, 2) had never heard of this method or 3) thought that it did not have positive benefits.

Table 1

Reasons for not Milking the Umbilical Cord

(n= 27)

| Reason for not milking | Responses | Percent |
|---|---|---|
| Never learned | 8 | 29.6 |
| No good data indicating its performance | 6 | 22.2 |
| Not important | 2 | 7.4 |
| No good data and other | 2 | 7.4 |
| Never learned and no good data | 2 | 7.4 |
| Other | 7 | 26.0 |
| Total | 27 | 100.0% |

The fourth question asked respondents who do not "milk" the umbilical cord (n=27, 81.8%) to indicate what would cause them to "milk" the cord. The results to this question are presented in Table 2. The majority of respondents 19 (70.4%) indicated "other." Included in these other responses were 1) reduced need for transfusions, 2) evidence that shows it is a helpful procedure, 3) anemic, 4) a pale body, 5) nothing would cause them to "milk" the cord, 6) undecided, or 7) had never heard of this procedure. The remaining respondents indicated they would milk the cord if the baby

was cyanotic (n=5, 18.5%), had poor muscle tone (n=1, 3.7%), or if the baby was cyanotic, had poor respiratory effort, and poor muscle tone (n=2, 7.4%).

Table 2

For Those who do not Milk the Cord, Reasons They Might Start Milking the Cord

(n= 27)

| Reason for milking | Responses | Percent |
|---|---|---|
| Cyanotic baby | 5 | 18.5 |
| Poor muscle tone | 1 | 3.7 |
| Cyanotic baby, poor respiratory effort, poor muscle tone | 2 | 7.4 |
| Other | 19 | 70.4 |
| Total | 27 | 100.0% |

The fifth question asked the respondents who "milk" the cord (n=6, 18.2%) to indicate the percentage of umbilical cords they milk in a one month period. The mean of these six responses reveal that in a one month period, these physicians milk 85% of their patients' umbilical cords.

The sixth question was also for the respondents who "milk" the cord. It asked them to indicate if they documented milking the umbilical cord in the patient's medical record. All of the respondents (n=6, 100%) indicated they do not document the procedure of milking the cord in the infant's medical record.

Question 7 asked all (n=59) of the respondents to indicate whether or not they thought milking the cord was beneficial to the infant. The majority of the respondents (n=35, 59.3%) indicated they were undecided, 13 (22%) believed it would be helpful, and 11 (18.6%) thought it would be harmful.

In the eighth question, all respondents (n=59) were asked to answer what benefits milking the umbilical cord provided the infant. The results are shown in Table 3. The majority of the respondents (n=26, 44.1%) answered "other." These responses included 1) higher hematocrit for the infant, 2) if there has been fetal blood loss, 3) unsure, and 4) not beneficial. The remaining respondents thought it would provide improved color (n=13, 22%), improved muscle tone (n=4, 6.8%), improved general condition (n=1, 1.7%), improved respiratory effort (n=3, 5.1%), improved color and improved muscle tone (n=1, 1.7%), improved muscle tone and improved general condition (n=3, 5.1%), improved color and improved general condition (n=3, 5.1%), and improved color, improved general condition, and improved respiratory effort (n=3, 5.1%). Two (3.4%) of the responding physicians believed that milking the cord would improve color, muscle tone, general condition, and respiratory effort.

Question 9 asked all respondents (n=59) to indicate what possible harm milking the umbilical cord could cause the infant. The data is presented in Table 4. Twenty-one (35.6%) answered "other." These responses included 1) could delay resuscitation, 2) puts debris from the cord into the blood, 3) delays warming, 4) physician lost his license for performing the procedure, 5) volume overload, 6) unsure, or 7) thought it would not harm the infant. The remaining respondents thought that milking could increase red blood cell count (n=4, 6.8%), increase the rate of neonatal jaundice (n=8, 13.6%), complicate

delivery (n=8, 13.6%), increase red blood cell count and increase the rate of neonatal jaundice (n=12, 20.3%), increase red blood cell count and other (n=2, 3.4%), increase red blood cell count, neonatal jaundice, and complicate delivery (n=1, 1.7%), increase neonatal jaundice and other (n=1, 1.7%), increase red blood cell count and complicate delivery (n=1, 1.7%), and increase red blood cell count, neonatal jaundice, and complicate delivery (n=1, 1.7%).

Table 3

Benefits of Milking the Cord

(n= 59)

| Benefits | Responses | Percent |
|---|---|---|
| Improved color | 13 | 22.0 |
| Improved muscle tone | 4 | 6.8 |
| Improved general condition | 1 | 1.7 |
| Improved respiratory effort | 3 | 5.1 |
| Improved color and muscle tone | 1 | 1.7 |
| Improved color, muscle tone, general condition and respiratory effort | 2 | 3.4 |
| Improved color and general condition | 3 | 5.1 |
| Improved color, general condition, and respiratory effort | 3 | 5.1 |
| Improved muscle tone and general condition | 3 | 5.1 |
| Other | 26 | 44.1 |
| Total | 59 | 100.0% |

The tenth question asked all respondents (n=59) to indicate if they thought milking the cord should be used routinely in the birthing procedure. Only eight (13.6%) thought it should be used routinely, seven (11.9%) were unsure, and the majority of respondents (n=44, 74.6%) thought it should not be used routinely in the birthing procedure.

Table 4

Drawbacks of Milking the Cord

(n= 59)

| Drawbacks | Responses | Percent |
|---|---|---|
| Increased red blood cells | 4 | 6.8 |
| Increased rate of neonatal jaundice | 8 | 13.6 |
| Complicates delivery | 8 | 13.6 |
| Increased red blood cells and increased rate of neonatal jaundice | 12 | 20.3 |
| Increased red blood cells and other | 2 | 3.4 |
| Increased rate of neonatal jaundice, complicates delivery, and other | 1 | 1.7 |
| Increased rate of neonatal jaundice and other | 1 | 1.7 |
| Increased red blood cells and complicates delivery | 1 | 1.7 |
| Increased red blood cells, increased rate of neonatal jaundice, and complicates delivery | 1 | 1.7 |
| Other | 21 | 35.6 |
| Total | 59 | 100.0% |

## Discussion

The results of this survey of Indiana family physicians demonstrates that the practice of milking an infant's umbilical cord is not a routine medical procedure. More specifically, the data indicate that only six (18.2%) of the responding physicians who practice obstetrics routinely "milk" the cord. These results are consistent with data found in the literature.

The review of literature in Chapter Two indicated that milking the umbilical cord after delivery was traditional in developing countries, but not a common practice in the United States. Further, the literature stated that physicians believe milking the cord could be detrimental to the infant's health. This later statement is not consistent with the results of this study, 35 (58.3%) of physicians responding to this survey were undecided and 13 (22%) thought it could be helpful.

Overall, the data generated from this survey indicates that Indiana family physicians are not well informed on milking the umbilical cord. Of those physicians who do not "milk" the cord (n=27, 81.8%), eight (26%) stated they never learned and four (14.8%) had not heard of this procedure. In order for milking the umbilical cord to become a standard procedure, clinical trials and research concerning the benefits of the procedure must be carried out. This is demonstrated by the fact that 13 (48.15%) of the 27 "non-milking" physicians stated they would "milk" the cord if evidence shows that it is a helpful procedure.

Due to the lack of knowledge about milking the cord, the overall opinion of physicians appears to be uncertain. That is, when asked what benefits milking the umbilical cord could provide the infant, 13 (22.0%) physicians were unsure and 10

(16.9%) believed if would not be beneficial. A similar pattern was found when the physicians were asked what harm milking the umbilical cord could cause the infant. Ten (16.9%) physicians were unsure and five (8.47%) thought it would not harm the infant.

## Limitations

There results of this study cannot be viewed without considering the limitations of the study.

A major limitation of the study was the low usable return rate with only 59 (20%) of the surveys being returned. This can be attributed at least in part to the method of distribution, a fax machine. This method was chosen in order to minimize costs. However, it may not have been the data collection method that would generate the most responses. Out of 387 subjects, 45 (11.6%) fax numbers were either disconnected or a wrong number. Also, 41 (10.6%) surveys returned stated that the intended recipient did not work at that number. This lowered the original sample number down to 301. The researcher assumed that the list of numbers obtained were either outdated or incorrectly typed when put into the Indiana Academy of Family Physicians database.

In an attempt to receive the most responses possible, the survey was faxed three times, once to all subjects with the two follow-up groups to non-respondents only. Although this did yield more responses each time, it may have irritated some physicians and kept them from responding at all. Due to their busy schedules, some may have viewed the survey as an inconvenience or a waste of their time.

Besides the problems associated with the collection of data using the fax machine, other issues may have limited the response rate. These include a lack of interest of

family physicians in the topic, physicians considered the instrument a joke, or the physician was unfamiliar with the topic and could not answer the question honestly.

# CHAPTER FIVE

# SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

## Introduction

This chapter presents a summary of the problem, as well as the procedures used in the study, conclusions, and recommendations for implementation and for future study.

## Summary

The purpose of this study was to identify the prevailing opinions of the drawbacks and benefits of milking an infant's umbilical cord immediately after delivery.

Based on a review of literature, an original instrument was designed due to the lack of an existing instrument that dealt with the specific topic. To establish content validity, a jury of experts which consisted of nine physicians was asked to review the instrument. Based on the suggestions made by the jurors, modifications to the instrument were made. The finalized questionnaire was then faxed to a random sample (n=387) of Indiana family physicians. Of the 387 questionnaires, 45 (11.6%) were sent to disconnected or wrong numbers and 41 (10.6%) were returned because the physician no longer worked at that location. This left a population of 301 physicians. A total of 59 (20%) usable questionnaires were returned and used in the analysis.

## Conclusions

On the basis of the results and analysis of the data within the limitations of the study, the following conclusions can be drawn:

1. With only 6 (18.2%) of the respondents stating that they "milked" the umbilical cord, this is not a common practice among Indiana family physicians.
2. Of those physicians who routinely milk the cord (n=6), they do so on average 85% of the time.
3. Those respondents who do not "milk" the cord (n=13, 48.15%), almost half indicated they would milk the cord if there was evidence to show it benefited the infant.
4. Overall, the majority of respondents (74.6%) do not believe that milking the umbilical cord should be routinely practiced. However, if evidence presents itself that this is a beneficial procedure, they indicated their opinion may change.

## Recommendations

Based on the results of this study, the following recommendations are made.

Recommendations for future study:

1. To survey a larger sample of Indiana family physicians through a more traditional method of data collection such as a mail survey. Due to the larger sample and the traditional survey method, the number of responses should increase.
2. To survey the same population again in several years. This will asses whether the opinions and practice of milking the umbilical cord have changed.
3. To survey a sample of family physicians across the United States. Data collected from such a survey could be compared to the data obtained from Indiana family physicians to see how opinions and practice of milking the cord varies throughout the United States.

Recommendations for implementation:

1. To call the office of the selected physicians, verify the fax number and that the physician is still employed at that office. This will reduce the number of faxes sent to disconnected numbers or incorrect offices not only for future studies using this methodology but for other types of communications.

## References


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# APPENDIX A

BALL STATE UNIVERSITY

ACADEMIC AFFAIRS
OFFICE OF ACADEMIC RESEARCH AND SPONSORED PROGRAMS

Muncie, Indiana 47306-0155
Phone: 765-285-1600
Fax: 765-285-1624

INSTITUTIONAL REVIEW BOARD

TO: Nicole Horn
4274 W. Woods Edge Lane

FROM: Bryan Byers, Chair
Institutional Review Board

DATE: October 17, 2002

RE: Human Subjects Protocol I.D. – IRB #03-97

---

The Institutional Review Board has recently approved your project titled "The Benefits and Drawbacks of Milking the Umbilical Cord " as revised as an exempt study. Such approval is in force from October 17, 2002 to October 16, 2003.

It is the responsibility of the P.I. and/or faculty supervisor to inform the IRB:

- when the project is completed, or
- if the project is to be extended beyond the approved end date,
- if the project is modified,
- if the project encounters problems,
- if the project is discontinued.

Any of the above notifications should be addressed in writing to the Institutional Review Board, c/o the Office of Academic Research & Sponsored Programs (2100 Riverside Avenue). Please reference the above identification number in any communication to the IRB regarding this project. Be sure to allow sufficient time for extended approvals.

pc: James McKenzie

rlb

Cardinal
*Health System, Inc.*
Ball Memorial Hospital
Institutional Review Board

# APPENDIX B

November 8, 2002

Nicole Horn
4274 W. Wood Edge Ln.
Muncie, IN 47304

Dear Ms. Horn:

The Ball Memorial Hospital Institutional Review Board Exempt Review Committee reviewed the following proposed study:

**The Benefits and Drawbacks of Milking an Umbilical Cord: A Physician Opinion Survey. (BMH Study #567)**

On November 8, 2002 the Exempt Review Committee approved your proposal as an exempt study under category 2. This approval is contingent upon your abiding by the Ball Memorial Hospital IRB's research guidelines. It is the responsibility of the Principal Investigator to ensure that strict confidentiality of patient information, research data and any materials used to gather data be maintained by all persons associated with this research project. Violation of confidentiality will result in termination of this study and could lead to legal and/or civil penalties.

IRB approval of this study is valid for one year (IRB approval expires November 7, 2003), however, continuing review and re-approval is conducted by the IRB on an eleven-month basis. A continuing review report will be required in October 2003 to receive approval for another year. You will be notified when this report is due.

If the study is completed before that time, please submit the results as soon as possible.

You must report any changes, adverse events, and/or unanticipated problems involving this project to the IRB in a timely manner.

Sincerely,

David Sursa
Chairperson
Institutional Review Board

ebb

2401 University Ave. • Muncie, IN 47303-3499 • Office: (765) 747-8458 • Fax: (765) 747-8459

# APPENDIX C

## Questionnaire

**Instructions:** Circle the answer that applies to your response. If a written response is needed, space will be provided.

1. Do you practice obstetrics in your practice? **YES** **NO** (skip to question #8)

2. On average, how many deliveries do you perform in one month? _____

3. Do you ever "milk" an infants' umbilical cord? **YES** (skip to question #6) **NO**

4. Why do you not milk the umbilical cord?

____ Never learned ____ Not important ____ Takes too much time

____ No good data indicating its performance ____ Other (please specify)

5. If you do not milk the umbilical cord, what would cause you to perform this procedure (check all that apply)? After completing this question, skip to question #8.

____ Cyanotic baby ____ Poor respiratory effort ____ Poor muscle tone

____ Other (please list)

6. On average, what percentage of umbilical cords do you milk in a one month delivery period?

7. Do you document milking the umbilical cord in the patients medical record?

   **YES** **NO**

8. Do you believe that milking an infants umbilical cord could be beneficial to the newborn?

   **YES** **NO** (skip to question #10)

9. What benefits do you think milking the umbilical cord provides the newborn?

____ Improved color/less cyanotic ____ Improved muscle tone

____ Improved general condition ____ Improved respiratory effort

____ Other (please list)

10. Do you believe that milking an infants' umbilical cord could be potentially harmful to the newborn?

**YES** **NO** (skip to question #12)

11. What harm do you think could be done to the infant whose umbilical cord is milked (please check all answers that apply)?

____ Dangerously increased red blood cell levels ____ Other

____ Complicates delivery process ____ Increased rate of neonatal jaundice

12. Do you think milking the umbilical cord should be routinely used in the birthing procedure?

**YES** **NO**

Why or why not?

13. Do you think milking the umbilical cord should be taught in medical schools?

**YES** **NO**

Why or why not?

14. What is your sex? **MALE** **FEMALE**

15. What is your age?

16. Including your residency, how long have you practiced medicine?

17. How long have you practiced Obstetrics?

**Thank you for completing this survey. Your input is crucial. Please return this survey via fax to 765-282-1068.**

# APPENDIX D

June 10, 2002

Nicole Horn
Ball State University
Muncie, IN 47306

Dear Dr.,

My name is Nicole Horn, a senior at Ball Sate University. In order to graduate from the Honors College, I must complete a senior thesis. I am writing to request your assistance as a juror in validating an instrument that I am developing with Dr. Tricia Baird to collect data on milking the umbilical cord. This instrument is the basis for my thesis.

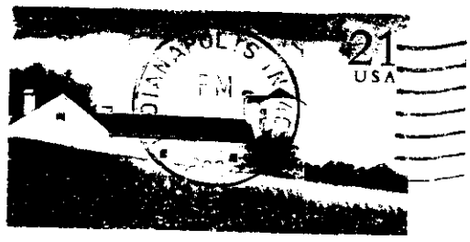
I am inviting you to participate in this process because of your work, knowledge, and interests in obstetrics. Participation in this process will include two reviews (one qualitative and one quantitative) of my draft instrument. I would estimate that each review would take you approximately 10-15 minutes to complete. Should you accept my invitation to serve as a juror, in the next few weeks you will receive a packet of materials including a copy of the draft instrument and instructions for completing the reviews.

Thank you for considering this request. Please return the enclosed postcard with your decision indicated by June 20, 2002. I look forward to hearing from you soon.

Sincerely,
Nicole Horn

ndhorn@bsu.edu
317-984-5311

# APPENDIX E




Nicole Horn
PO Box 948
Cicero, IN 46034

Lemming

I wish to serve as a juror

Yes X No ___

Please return by June 20, 2002

# APPENDIX F

**Jurors**

1) Dr. Scott Reece, MD
2) Dr. Jeff Bird, MD
3) Dr. Amy Banter, MD
4) Dr. Stewart Brown, MD
5) Dr. Nick Lemming, MD
6) Dr. Tricia Baird, MD
7) Dr. John Fye, MD
8) Dr. Lloyd Stolworthy, MD
9) Dr. Beth Henderson, MD

# APPENDIX G

June 25, 2002

Nicole Horn
Ball State University
Muncie, IN 47306

Dear Dr.,

Thank you for agreeing to serve on the jury of experts for the development of the data collection instrument I am developing on milking the umbilical cord. Your input and feedback are important to establish the validity of the instrument. As noted in earlier correspondence, I estimate the each of your two reviews of this 17 item instrument will take approximately 10 minutes.

Enclosed you will find a copy of the draft instrument to be reviewed, specific directions to follow while completing your review, and a self-addressed stamped return envelope in which to return your work. Please fell free to write your comments on the instrument or use additional paper as needed. Return the instrument with your comments in the envelope so it will reach me no later than July 8, 2002. If you have any questions, please fell free to contact me. Please accept my thanks in advance for your help and advice in the development of this instrument.

Sincerely,

Nicole Horn
317-984-5311
ndhorn@bsu.edu

Encl: Instrument, directions, return envelope

# APPENDIX H

Instructions

The following pages contain questions that apply to the instrument. Circle the answer that corresponds to your response. If a written explanation is needed, space will be provided. Please feel free to write any additional comments not covered by the questions on the remaining paper space or additional paper.

1) Is the title of the instrument appropriate? **YES** (skip to question 3) **NO**

2) If you answered NO to question #2, what changes would you suggest for the title?

3) Are the instructions given in the instrument concise? **YES** (skip to question 5) **NO**

4) If you answered NO to question #4, what changes would you suggest to make the instrument concise?

5) Are the instructions in the instrument clear? **YES** (skip to question 7) **NO**

6) If you answered NO to question #5, what changes would you suggest to make the instrument clear?

7) Are the instructions in the instrument complete? **YES** (skip to question 9) **NO**

8) If you answered NO to question #7, what changes would you suggest to make the instrument complete?

9) Is the content covered by the instrument appropriate? **YES** (skip to question 11) **NO**

10) If you answered NO to question #9, what changes would you suggest to make the instrument appropriate?

11) Is the content area covered by the instrument complete?
**YES** (skip to question 13) **NO**

12) If you answered NO to question #11, what changes would you suggest to make area covered by the instrument complete?

13) Are the items contained within the instrument appropriate?
**YES** (skip to question 15) **NO**

14) If you answered NO to question #13, what changes would you suggest to make the items contained within the instrument appropriate?

15) Are the items contained within the instrument clear? **YES** (skip to question 17) **NO**

16) If you answered NO to question #15, what changes would you suggest to make the items contained within the instrument clear?

17) Does the instrument supply an adequate number of responses for the questions?
**YES** **NO**

18) Should any of the items within the instrument be revised? **YES** **NO** (skip to question 20)

19) Which items should be revised and why?

20) Should any of the items within the instrument be deleted? **YES** **NO** (skip to question 22)

21) Which items should be deleted and why?

22) Do you feel any additional items should be added to the questionnaire? **YES** **NO**

23) What should be added to the instrument?

# APPENDIX I

Instructions

The following review will be used to determine the final validity of the enclosed instrument. Beside each question, a scale of 2-0 will be present. This scale will be used to determine the final question content of the instrument. The scale breakdown is as follows:

**2: Essential question**

**1: Useful question, but not essential**

**0: Not a necessary question**

Please read each question carefully and circle the score that you think applies to each question. When you have completed your review, please enclose it in the self-addressed stamped envelope. Thank you again for your help.

## Umbilical Cord Milking Questionnaire

**Instructions:** This survey pertains to a practice known as "milking the cord". This is a procedure that involves pushing umbilical cord blood away from the placenta and towards the baby just before the cord is clamped and cut. Circle the answer that applies to your response. If a written response is needed, space will be provided.

1. Do you perform obstetrics in your practice? YES NO (skip to question #8) **2 1 0**

2. How long have you practiced Obstetrics? _____ **2 1 0**

3. On average, how many deliveries do you perform in 1 month? _____ **2 1 0**

4. Do you ever "milk" an infant's umbilical cord by moving blood from the cord toward the baby before clamping the cord?

YES (skip to question #6) NO **2 1 0**

5. Why do you not "milk" the umbilical cord? **2 1 0**

___ Never learned ___ Not important

___ Takes too much time ___ No good data indicating its performance

___ Other (please specify)

6. If you do not milk the umbilical cord, what would cause you do perform this procedure (check all that apply) ? After completing this question, skip to question #8.
**2 1 0**

___ Cyanotic baby ___ Poor respiratory effort

___ Poor muscle tone ___ Other (please list)

7. On average, what percentage of umbilical cords do you milk in a one month delivery period? **2 1 0**

8. Do you document milking the umbilical cord in the patient's medical record?
YES NO **2 1 0**

9. I believe that milking an infants umbilical cord could be? **2 1 0**

Helpful Harmful Undecided

10. What benefits do you think milking the umbilical cord provides the newborn? (please check all answers that apply) **2 1 0**

___ Improved color/less cyanotic ___ Improved muscle tone

___ Improved respiratory effort ___ Improved general condition

___ Other (please list)

11. What harm do you think could be done to the infant whose umbilical cord is milked? (please check all answers that apply) **2 1 0**

___ Dangerously increased red blood cell levels ___ Other (please list)

___ Complicates delivery process ___ Increase rate of neonatal jaundice

12. Do you think milking the umbilical cord should be used routinely in the birthing procedure? **2 1 0**

YES NO

Why or why not? **2 1 0**

13. Do you think milking the umbilical cord should be taught in medical school? **2 1 0**

YES NO

Why or why not? **2 1 0**

14. What is your sex? MALE FEMALE **2 1 0**

15. What is your age? **2 1 0**

16. Including your residency, how long have you practiced medicine? **2 1 0**

Thank you for completing this survey. Your input is crucial. Please return this survey via fax to 765-282-1068.

# APPENDIX J

## Umbilical Cord Milking Questionnaire

Instructions: This survey pertains to a practice known as "milking the cord". This is a procedure that involves pushing umbilical cord blood away from the placenta and towards the baby just before the cord is clamped and cut. Circle the answer that applies to your response. If a written response is needed, space will be provided. If you don't want to participate in the study, please check the space below and fax the survey back to 765-282-1068

____ I don't want to participate in the study

1. Do you perform obstetrics in your practice?
   YES NO (if no skip to question #7)

2. Do you ever "milk an infant's umbilical cord by moving blood away from the cord and toward the baby before clamping the cord?
   YES (if yes skip to question #5) NO

3. Why don't you "milk" the umbilical cord?

Never learned ___ No good data indicating its performance __ Not important

___ Takes too much time ___ Other (please specify) _____

_____

4. If you do <u>not milk</u> the umbilical cord, what would cause you to perform this procedure (check all that apply)? After completing this question, skip to question #7.

___ Cyanotic baby ___ Poor respiratory effort ___ Poor muscle tone

___ Other (please list) _____

_____

5. On average, what percentage of umbilical cords do you milk in a one month delivery period? _____ %

6. Do you document milking the umbilical cord in the patient's medical record?
   YES NO

7. I believe that milking an infants umbilical cord <u>could</u> be?

   Helpful Harmful Undecided

8. What benefits do you think milking the umbilical cord provides the newborn (please check all answers that apply)?

___ Improved color/less cyanotic ___ Improved muscle tone

_ Improved general condition ___ Improved respiratory effort

___ Other (please list) _____

_____

9. What harm do you think could be done to the infant whose umbilical cord is milked (please check all answers that apply)?

___ Dangerously increased red blood cell level ___ Increased rate of neonatal jaundice

___ Complicates the delivery process ___ Other (please list) _____

_____

10. Do you think milking the umbilical cord should be used routinely in the birthing procedure? YES NO UNDECIDED

Thank you for completing the survey. Please return this survey via fax to 765-282-1068.

# APPENDIX K

# FAX COVER

From :Tricia Baird, M.D. and Nicole Horn

Company : Ball Memorial Family Practice
Residency and Ball State University

Fax Number : 765-282-1068

**Subject : Umbilical Cord Milking Questionnaire**

**Pages including cover page: 2** **Date : 1/14/03**

## MESSAGE

**Dear Colleague,**

**As you know, less than 25% of the medicine we practice today has documented statistical benefit to our patients. Today, we are asking you for help in a survey that hopes to change that.**

**Currently, we are exploring the potential outcomes of stripping or milking the umbilical cord of an infant following delivery. You could help us greatly by taking five minutes to complete the attached instrument and fax it back to the number provided.**

**Although the surveys are confidential, we do ask that you fax the survey back with an identifying cover sheet. This cover sheet will be used for tracking purposes and only group data will be reported. Thank you for you time.**

**Sincerely,**
**Tricia Baird, M.D., Ball Memorial Family Practice Residency**
**Nicole Horn, Ball State University**